

Amendments to the Claims:

This listing of claims will replace all prior versions and listings of claims in the application.

Listing of Claims:

1. (Currently amended) A semiconductor device equipped with a fuel cell, the semiconductor device comprising a fuel cell and a semiconductor element,
wherein
the fuel cell includes [[an]] a plate-type anode separator in which a flow channel for fuel is formed, a plate-type cathode separator in which a flow channel for oxidizer is formed, and a membrane electrode assembly interposed between the anode separator and the cathode separator,
the semiconductor element is formed on a principal surface of one separator selected from the anode separator and the cathode separator,
the membrane electrode assembly is in contact with a surface of the selected separator that is opposite to the principal surface on which the semiconductor element is formed,
the anode separator and the cathode separator function as charge collectors for collecting electric power generated in the membrane electrode assembly, and
the semiconductor element and the selected separator are connected electrically.
2. (Original) The semiconductor device according to claim 1,
wherein two of the semiconductor elements are included, the semiconductor elements being a first semiconductor element formed on a principal surface of the anode separator, and a second semiconductor element formed on a principal surface of the cathode separator.
3. (Original) The semiconductor device according to claim 1,
wherein the selected separator is formed with a semiconductor substrate.
4. (Original) The semiconductor device according to claim 3,
wherein the semiconductor substrate is made of crystalline silicon.
5. (Original) The semiconductor device according to claim 3,

wherein the semiconductor substrate is made of a compound semiconductor containing an element of the group IIIb and an element of the group Vb.

6. (Original) The semiconductor device according to claim 3,
wherein the semiconductor substrate is made of a compound semiconductor containing an element of the group IIb and an element of the group VIb.
7. (Original) The semiconductor device according to claim 3,
wherein the anode separator is formed with a N-type semiconductor substrate and the cathode separator is formed with a P-type semiconductor substrate.
8. (Original) The semiconductor device according to claim 3,
wherein the fuel cell further includes a contact layer arranged between the selected separator and the membrane electrode assembly so as to reduce a contact resistance between the selected separator and the membrane electrode assembly.
9. (Currently amended) The semiconductor device according to claim 1,
wherein the fuel cell further includes an insulation layer formed between the ~~semiconductor element and the selected separator~~ the principal surface of the selected separator on which the semiconductor element is formed and the surface of the selected separator that is in contact with the membrane electrode assembly.
10. (Currently amended) The semiconductor device according to claim 9,
wherein the principal surface of the selected separator on which the semiconductor element is formed is connected electrically with the surface of the selected separator that is in contact with the membrane electrode assembly via an electrode formed in the insulation layer, and
electric current generated in the membrane electrode assembly is supplied to the semiconductor element.
11. (Original) The semiconductor device according to claim 9,

wherein the insulation layer is made of SiO_2 .

12. (Original) The semiconductor device according to claim 9,
wherein the insulation layer has a specific resistance of not less than $10^5 \Omega \cdot \text{cm}$.
13. (Original) The semiconductor device according to claim 9,
wherein the insulation layer has a thickness in a range of 10 nm to 1 μm .
14. (Original) The semiconductor device according to claim 9,
wherein the selected separator is made of a metal.
15. (Original) The semiconductor device according to claim 14,
wherein the insulation layer is a metal oxide film.
16. (Original) The semiconductor device according to claim 1,
wherein
the semiconductor element includes a first electrode and a second electrode,
the first electrode is connected electrically with the anode separator, and
the second electrode is connected electrically with the cathode separator.
17. (Original) The semiconductor device according to claim 1,
wherein
the semiconductor element is a N-channel MOS transistor,
a source electrode and a substrate electrode of the N-channel MOS transistor are
connected electrically with the anode separator, and
a drain electrode and a gate electrode of the N-channel MOS transistor are connected
electrically with the cathode separator.
18. (Original) The semiconductor device according to claim 1,
wherein
the semiconductor element is a P-channel MOS transistor,

a source electrode and a gate electrode of the P-channel MOS transistor are connected electrically with the anode separator, and
a drain electrode and a substrate electrode of the P-channel MOS transistor are connected electrically with the cathode separator.

19. (Original) The semiconductor device according to claim 1,
wherein the fuel cell is formed by stacking a plurality of cells, each cell including the anode separator, the cathode separator, and the membrane electrode assembly.

20. - 25 (Canceled)